USER'S MANUAL

Star FGR006
IDTECK FGR006SR
iPASS IP-FGR006
Star FGR006EX

Fingerprint & Proximity Reader

Rev.4.2.0

IDTECK

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1. Important Safety Instructions

When using your Single Door Controller, basic safety precautions should always be followed to reduce the risk of fire, electrical shock, and injury to persons. In addition, the following should also be followed:

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on the product.
3. **Do not** use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning. If necessary, use mild soap.
4. **Do not** use this product near water, such as bath-tub, wash bowl, kitchen sink, laundry tub, in a wet basement, or swimming pool.
5. This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your installation site, consult your dealer or local power company.
6. **Never** push objects of any kind into this product or through the cabinet slots as they may touch voltage points or short out parts that could result in fire or electric shock. Never spill liquid of any kind on the product.
7. To reduce the risk of electric shock, do not disassemble this product by yourself, but take it to qualified service whenever service or repair is required. Opening or removing the covers may expose you to dangerous voltages or other risks. Also, incorrect reassembly can cause electric shock when the unit is subsequently used.
8. **Unplug** this product from the Direct Current (DC) power source and refer to qualified service personnel under these conditions:
   a. When the power supply cord or plug is damaged or frayed.
   b. If liquid has been spilled on the product.
   c. If the product does not operate normally after following the operating instructions in this manual. Adjust only those controls that are covered by the operating instructions in this manual. Improper adjustment of other controls that are not covered by this manual may damage the unit and will often require extensive work by a qualified technician to restore normal operation.
   d. If the product exhibits a distinct change in performance.

2. General

The **STAR FGR006** is a Biometrics and Proximity Reader which is compatible to existing proximity readers. The **STAR FGR006** can be connected to any existing access control panel and you will have personal authorization by one's fingerprint to avoid any access from un-authorized person. The **STAR FGR006** has built-in proximity reader (The **STAR FGR006EX** has external reader port) and fingerprint module so that the access is only allowed when the personal ID and fingerprint are authorized. Its modern design gives you an easy installation (just replace existing reader) to metal door frame (mullion) or to any flat wall surface. The **STAR FGR006** ensures you a successful operation where you want biometrics access control. The **STAR FGR006** has three LED of red, green and lens(upper right), inside beeper sound to guarantee you an accurate and reliable access control.

3. Features

- Proximity/PIN and Fingerprint Verification
- Dual fingerprints registration
- Stores up to 1,000/2,000/4.000 Fingerprints
- 1:1Verification and 1: N Identification
- RS232 communication port for upload/download Fingerprints using PDA or Notebook (Optional)
- Registration / Verification mode using Master Card
- Off-line Add/Delete function using Master Card
- External Reader Port to work with existing Proximity Reader
- (26bit Wiegand) or Keypad / Magnetic stripe Reader(FGR006EX)
- 26bit Wiegand, ABA Track Ⅱ
- High Protection from Scratch and ESD (Electro Static Discharge)
- Tamper switch
- High Quality Optical Sensor

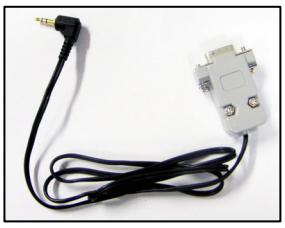
4. Identifying Supplied Parts

Please unpack and check the contents of the box.

Main Unit

Bezel

User's Manual



RS232 Serial Port (Optional)

5. Specification

CPU	32bit Microprocessor and Dual 8bit Microprocessor
Memory	Program Memory : 64KB EEPROM
Power / Current	DC 12V / Max. 350mA
User	1,000 / 2,000 / 4,5000 available
Reader Port (FGR006EX only)	1ea of external reader port
Data Format	26bit Wiegand, 8bit burst Format for keypad reader
Output Format	26bit Wiegand, ABA Track II Magstripe format (Caution : Card Present signal is Open Collector)
Communication	RS232, RS485, RS422(default, up to 255ch) selectable 4800bps and 9600bps (Default) 19200bps, 38400bps, 57600bps and 115200bps (Optional)
LED Control Input	Low active, maximum 20mA current drain (RS485)

Buzzer Control Input	Low active, maximum 20mA current drain (RS485)
Tamper Switch	Low active
LED Indicator / Beeper	3 LED Indicators / Piezo Buzzer
Color	Light and Dark Gray
Operating Temperature	-15℃ to 40℃ (-5°F to 104°F)
Operating Humidity	10% to 90% relative humidity non-condensing
Dimension (W x H x D)	2.6"x5.1"x2.0" (66x129x51mm)
Weight	230g (0.5 lbs)

6. Product Overview

6.1. Functions

The FGR006 is finger reader with integrated proximity reader and registration terminal.

Registration Mode

The registration mode registers or eliminates user cards.

Reader Mode

This function uses as reader.

RF Only Mode

: If card data is authorized, card ID will be transmitted to controller.

RF + FINGER Mode

: If fingerprint data is authorized, card ID will be transmitted to controller.

Master Card

A master card is used when it changes mode each other.

Card Number Output Form

If your fingerprint is authorized then output becomes the card number to 26bit Wiegand or ABA Track II according to an output type.

Error Signal Output

If your fingerprint is not authorized then FGR006(FGR006EX) will generate finger error signal for 500ms of low active pulse.(Only available when your FG006(FGR006EX) is set to 26bit Wiegand output) This signal is open collector.

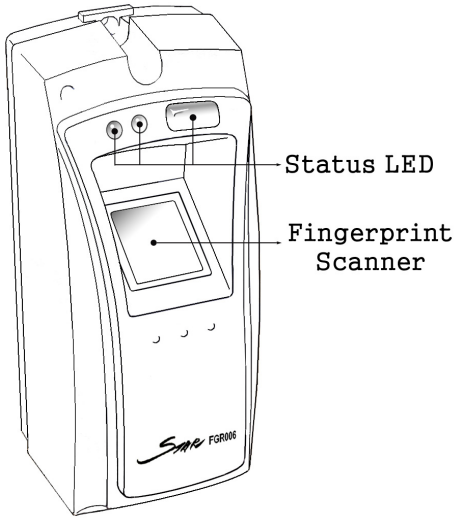
Card Number Input Form

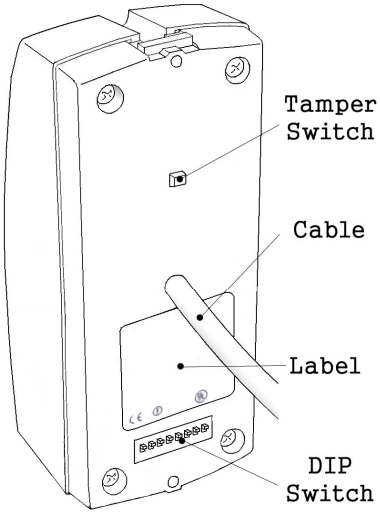
This function is only available when you use FGR006EX.

FGR006EX is input the card number in the outside but FGR006 is contained internally.
It takes a card input in a 8bit Burst or 26bit Wiegand or ABA Track II form.

6.2 PRODUCT EXPLANATION

6.2.1 PANEL DESCRIPTION





6.2.2. Color Coded & Wiring Table

IO PORT NAME	SIGNAL NAME	COLOR CODED
POWER		
Main Power(+12V)	+12V	RED
Power Ground	GND	BLACK
INPUT (Only available with RS232/RS485 Communication)		
LED Control Input	LED	BROWN
Buzzer Control Input	BEEP	BLUE
WIEGAND OUTPUT		
Wiegand Data-0	DATA0	GREEN
Wiegand Data-1	DATA1	WHITE
* Finger Error	ERROR	ORANGE
* Note that the Finger Error output is only available with Wiegand output.		
ABA TRACK II OUTPUT		
Card Present	CLS	Orange
Clock	CLK	White
Data	DATA	Green
RS485 COMMUNICATION PORT		
RS485-A	485A	Gray
RS485-B	485B	Yellow

RS422 COMMUNICATION PORT ➔ DEFAULT		
RS422 TX+	RS422 TX+	RS422 TX+
RS422 TX-	RS422 TX-	RS422 TX-
RS422 RX+	RS422 RX+	RS422 RX+
RS422 RX-	RS422 RX-	RS422 RX-
TAMPER SWITCH		
Tamper Switch	Tamper Switch	Tamper Switch
EXTERNAL READER PORT (FGR006EX Only)		
Wiegand Data-0	Wiegand Data-0	Wiegand Data-0
Wiegand Data-1	Wiegand Data-1	Wiegand Data-1

7. Installation Tips & Check Point

7.1. Recommended cable type and permissible length of cable

Description	Cable Specification	Maximum Distance
Reader (Power and Data) Reader -> ACU	Belden #9512, 22 AWG 4 conductor, shielded	150m
	Belden #9514, 22 AWG 8 conductor, shielded	

* Need thicker wire if you connect the reader with high current consumption.

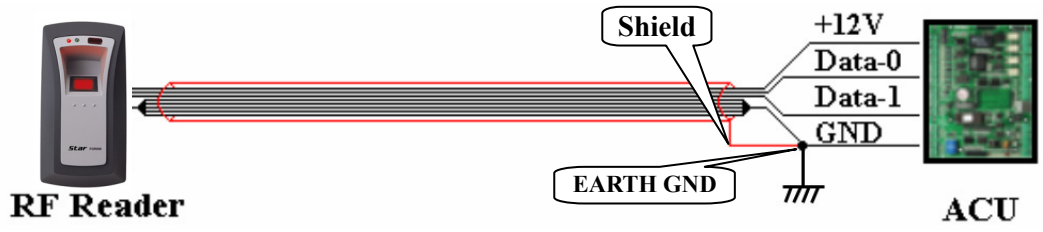
7.2. Reader connection

If you install the reader in a long distance between the ACU and the reader, you have to remind that there will be a voltage drop between both ends of GND wire. For example, if you connect a reader with 100mA current consumption at 100m distance (assume to using DC resistance of cable of 100Ω/100m) and the reader power is supplied from the ACU, the voltage drop of the GND wire will be 1V. In this case, the Wiegand data signal can not be measured lower than 1V.

The most of ACU is capturing the signal by the voltage level of data input and 1V is the critical point whether the ACU read the data logic “1” or logic “0” therefore the reader output can not be read correctly from the ACU.

You have to think about how you reduce the voltage drop between both ends of GND wire. There will be two methods to reduce the voltage drop and ACU can read data correctly.

- Reduce the DC resistance of GND wire; Using thick cable or add more wires to GND wire in parallel. If you connect 4 wires in parallel for GND, the DC resistance of GND wire will be reduced to 1/4 of single wire.
- Use separate power for the reader; Disconnect +12V wire from the ACU and connect external power supply to the reader nearby then there will be no current flow through the GND wire and no voltage drop between both ends of GND wire.



< Reader connection using additional wires >

< Reader connection using external power supply >

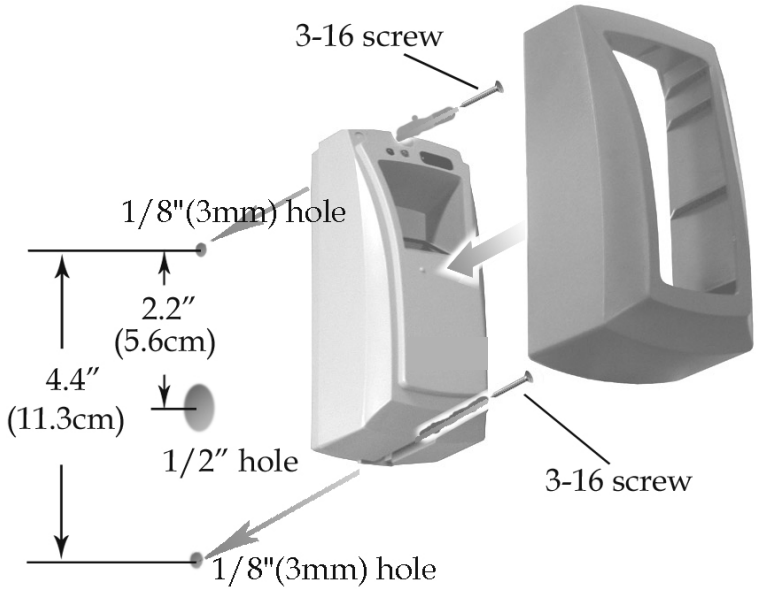
8. Installation of the Product

8.1. Mullion and Wall Mount

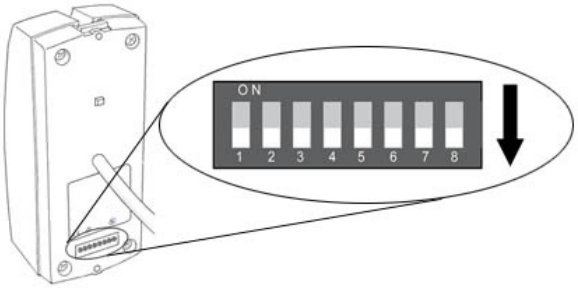
8.1.1 Drill two Ø1/8"(3mm) holes, 4.4"(113mm) apart in vertical and drill one Ø1/2" hole for the reader cable 2.2"(56mm) apart from the top hole.

8.1.2 Connect wires between the control panel and FGR006 reader then put reader cable into the center hole and install the main unit by using two 3-16 screws.

8.1.3 Put bezel into the main unit then push bezel until you hear the locking sound.



8.2. System Initialization



You can H/W initialize using DIP switches.

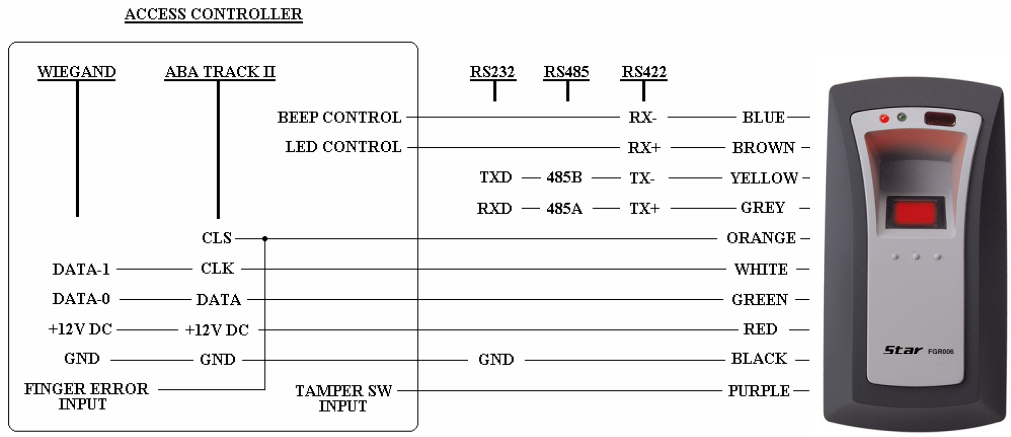
First, turn on the system power and turn off all DIP switches.

Set DIP switches after an initialization completion.

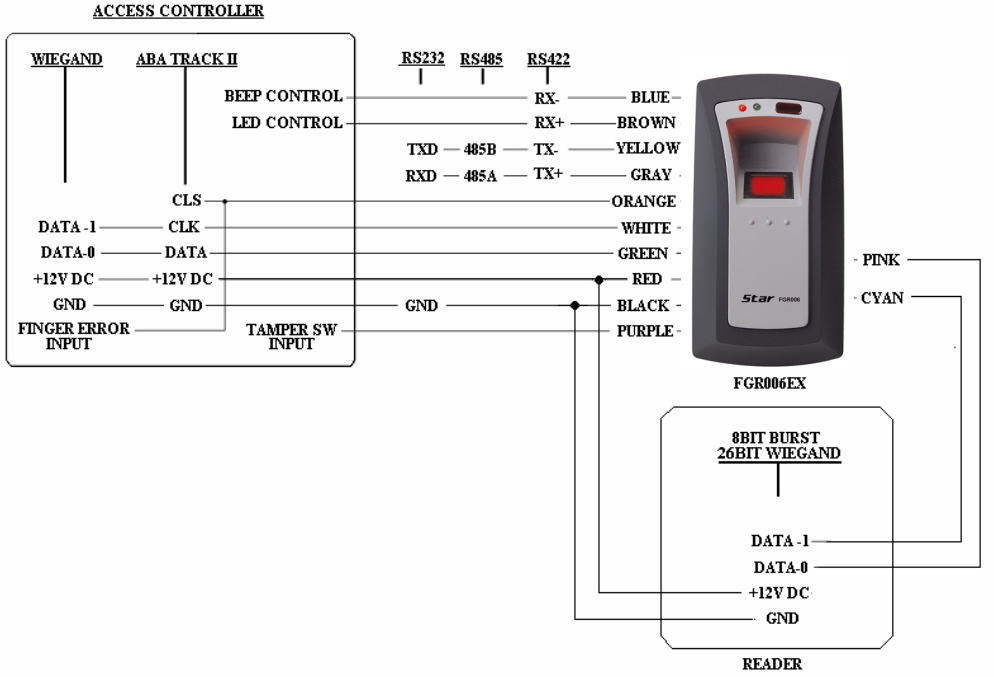
*** DIP Switch as used as address of RS422/RS485 communication.**

An Initialization situation refers to the "11.Operation Indication of Reader / Register" of manual.

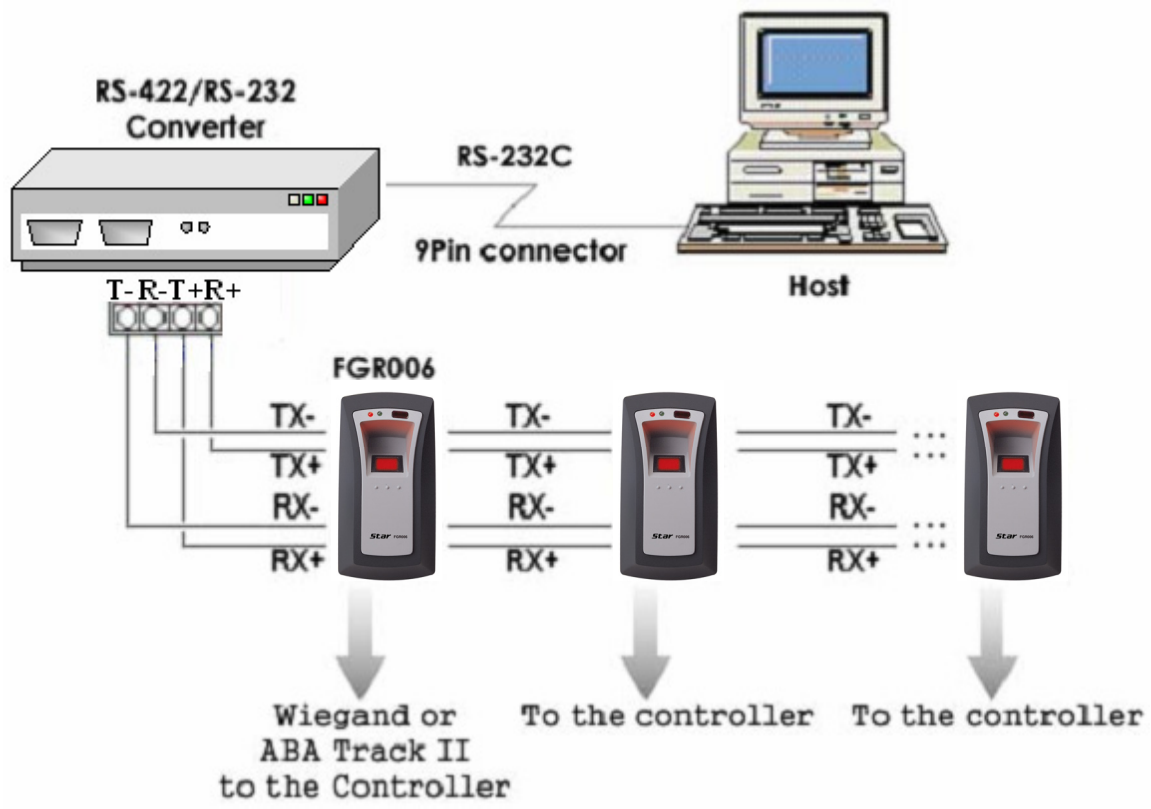
8.3. Wire Connection of FGR006



8.4. Wire Connection of FGR006EX

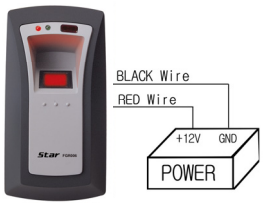


8.5. Network Connection of FGR006



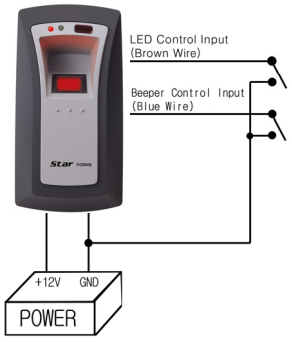
8.6. Wiring Example

8.6.1 Power



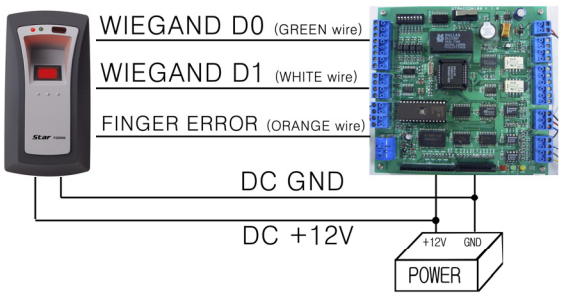
- Connect (+) wire of DC 12V power to Red wire
- Connect Power GND(-) wire of DC 12V to Black wire

8.6.2 Input Connection (Only available with RS232/RS485 communication)

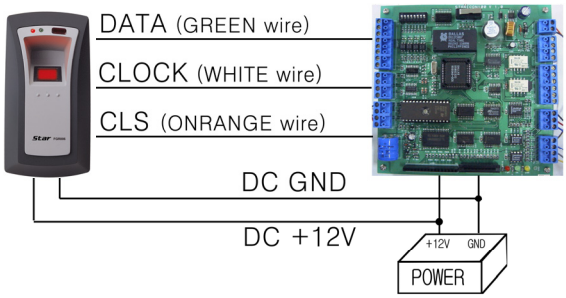


- A green LED turns on if the short does LED CONTROL INPUT wire with the GND.
- The beep sound appears if the short does BEEPER CONTROLER INPUT wire with the GND.

8.6.3 Output Connections

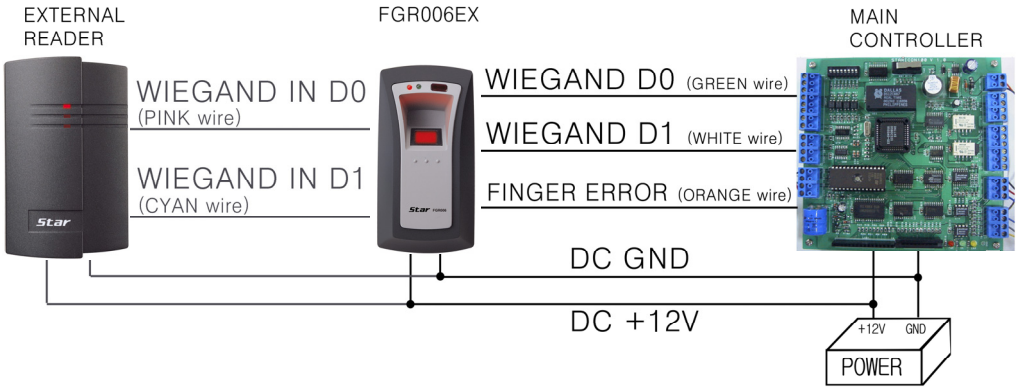


[26bit Wiegand Output]

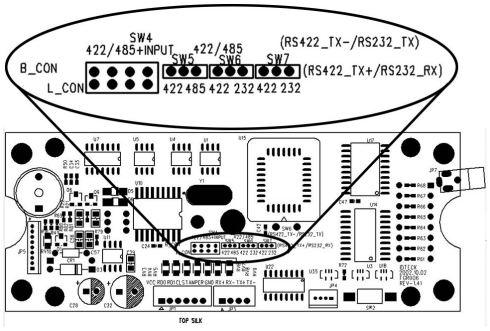


[ABA Track II Output]

8.6.4 External Reader Connection (FGR006EX Only)



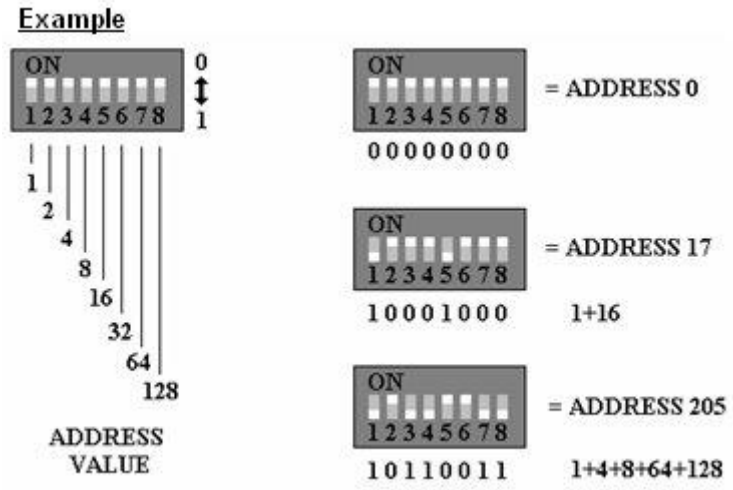
9. Communication



A communication setting up is basically RS422.
If you need the change of the communication mode separate FGR006(FGR006EX) and must set the jumper of MAIN PCB part.
A jumper setting up uses a soldering iron.

9.1. Address Setting for RS485 / RS422 Communication

There is 8bit DIP SW for address setting and it turns to 8bit binary code as below and each bit has fixed address value, the address is calculated the sum value of each bit set to “1” position.



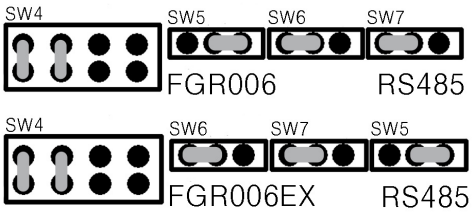
9.2. Address Setting for RS232 Communication Port Connection

You should use external RS232 serial cable.

- Connect connector for serial communication finished wiring on COM1 or COM2 port of PC.
- Install application software and then execute it.

※ **Please refer to 10.5 External RS232 Serial Jack (OPTION 2)**

9.3. Address Setting for RS485 Communication Port Connection



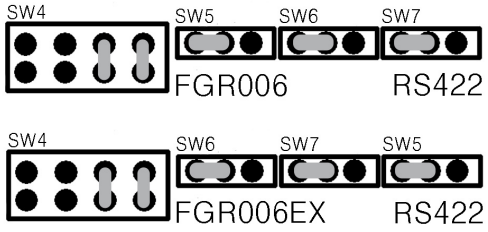
FGR006(FGR006EX) Wire		CNP-200A Converter Wire	
GRAY	RS485-A	RED	RS485-A
YELLOW	RS485-B	GRAY	RS485-B

Set the jumper as shown in the figure above.

RS-485/RS-232 converter is required to connect serial communication RS485 between Main Unit and PC(Personal Computer). The converter is CNP200A.

- Connect RS485 A, Gray wire of Main Unit to Red wire of CNP200A converter.
- Connect RS485 B, Yellow wire of Main Unit to Gray wire of CNP200A converter.
- Plug the RS232 9-pin connector of CNP200A converter into COM1 or COM2 Port of PC.
- Install and run the application software.

9.4. RS422 Communication Port Connection



FGR006(FGR006EX) Wire		CNP-200A Converter Wire	
YELLOW	RS422-Tx[-]	WHITE	Rx-
GRAY	RS422-Tx[+]	RED	Rx+
BLUE	RS422-Rx[-]	BLACK	Tx-
BROWN	RS422-Rx[+]	BLUE	Tx+

Set the jumper as shown in the figure above.

RS422/RS232 converter is require to connect serial communication RS422 between Main Unit and PC(Personal Computer). The converter is CNP200A.

- Connect RS422 Tx[-],Yellow wire of Main Unit to White wire(Rx[-] port) of CNP200A converter.
- Connect RS422 Tx[+], Gray wire of Main Unit to Red wire(Rx[+] port) of CNP200A converter.
- Connect RS422 Rx[-], Blue wire of Main Unit to Black wire(Tx[-] port) of CNP200A converter.
- Connect RS422 Rx[+], Brown wire of Main Unit to Blue wire(Tx[+] port) of CNP200A converter.
- Plug the RS232 9-pin connector of CNP200A converter into COM1 or COM2 Port of PC.
- Install and run the application software

10. Operation

10.1. Master Card Registration Mode

10.1.1 Master Card Registration

The card presented to the FGR006 for the first time after initialization becomes the master card.

A master card registration mode situation refers to the "11.Operation Indication of Reader / Register" of manual.

※ **Note: Master card is not using the master fingerprint**

10.1.2 Master Card Change

You can register Master Card again after initialization of hardware.

※ **CAUTION : If you initialize hardware, all user data are deleted.**

You can change master card by using the application software.

Using the application software keeps the user data unchanged.

Please refer the FGR006 software manual for download master card.

10.1.3 Master Card Function.

It is used as the key to change reader and registration mode mutually

※ ***For example***

In the Reader mode if you access master card, it is changed to registration mode.

In the Registration mode if you access master card again, it is changed to reader mode.

10.2. Reader Mode

10.2.1 Reader Mode Function.

A reader mode authorize user card.

If your fingerprint is authorized then the output is your card ID.

If your fingerprint is not authorized then output is error signal.

A reader mode situation refers to the "11.Operation Indication of Reader / Register" of manual.

10.2.2 Authorization Method

Present proximity card to the FGR006

Present proximity card to the external reader(FGR006EX only)

If your card ID is registered, fingerprint scanner will light on.

If your card ID is not registered, FGR006(FGR006EX) will make 2 beep sounds and return to the reader mode.

- ✓ RF + FINGER MODE: Put your finger on the fingerprint scanner for authorization. If your fingerprint is authorized then FGR006(FGR006EX) will turn on the lens. LED(upper light) indicator make a beep sound for a second and send your card ID to the access controller.

- ✓ RF Only: If card is authorized only without using fingerprint, LED(upper light) indicator make a beep sound for a second and send your card ID to the access controller.

If your fingerprint is not authorized then FGR006(FGR006EX) will make 2 beep sounds and generate finger error signal for 500ms of low active pulse.(Only available when your FGR006(FGR006EX) is set to 26bit Wiegand output)

10.3. Registration Mode

10.3.1 Registration Mode Function

The mode is the register an user card or to delete.

It deletes the card when an user card is registered. (4 beeps sounds)

It registers the card when an user card is not registered. (3 beep sounds)

10.3.1 User Card Registration.

- ✓ RF + FINGERPRINT MODE:

After reading user's card, you should register fingerprint two times.

Present the proximity card to the FGR006

Present the proximity card to the external reader (FGR006EX only)

Put the fingerprint when red light is illuminated on the fingerprint scanner.

Put the fingerprint again on the fingerprint scanner when the red light is illuminated again after the red light turns off.

It beeps 3 times when the registration is completed.

✓ RF Only:

Don't place your finger on fingerprint scanner after reading user's card.

It beeps 3 times when the registration is completed.

Register by method such as above, if there are cards to register additionally.

After registration present proximity master card again, and it is changed to the reader mode. It beeps 2 times when the registration is not correct.

10.3.2 User Card Deletion

Present the proximity card to the FGR006

Present the proximity card to the external reader(FGR006EX only)

It beeps 4 times when the deletion is completed.

After deletion present proximity master card again, and it is changed to the reader mode. It beeps 2 times when the deletion is not.

10.4. Identification Function (OPTION 1)

This function operates in the Reader mode.

User can be verified with Fingerprint template only. (No card necessary)

Sensor will be activated automatically when user place the fingerprint on the fingerprint scanner.

※ CAUTION : *This function must be applied when the number of user is less than 100.*

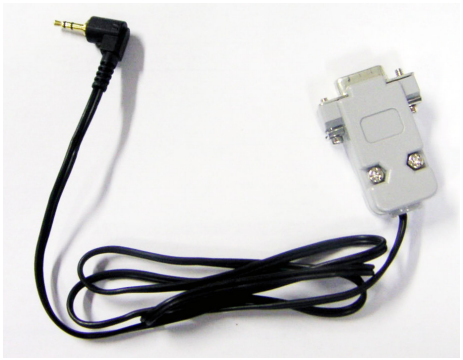
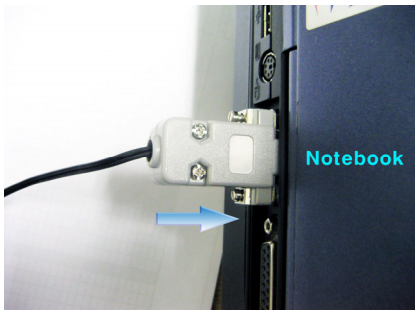
If your fingerprint is authorized then FGR006(FGR006EX) will turn on the lens led(upper light) and make a beep sound for a second and will send your card ID to the access controller.

If your fingerprint is not authorized then FGR006(FGR006EX) will make 2 beep sounds and generate finger error signal for 500ms of low active pulse.(Only available when your FGR006 (FGR006EX) is set to 26bit Wiegand output)

10.5. External RS232 Serial Jack (OPTION 2)

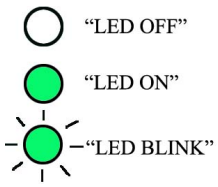
This function use in FGR006 to PC(or Notebook) when it connect directly.

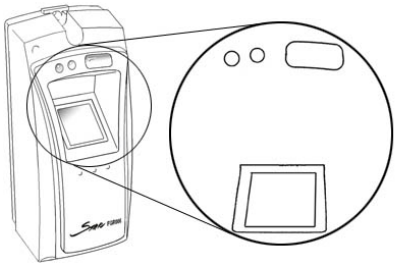
This function is possible the software though FGR006 are established to a stand alone type.

	
It use to connect with FGR006 and RS232 port of PC(or notebook).	It uncover TOP CASE in FGR006. Extract after you pull TOP CASE bottom of FGR006.
	
It insert RS232 serial jack at bottom of FGR006	It connect a d-sub connector with RS232 port of PC (or notebook).

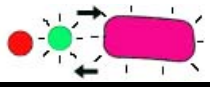
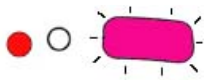
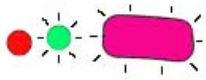
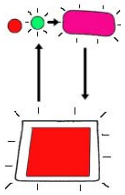
11. Operation Indication of Reader / Register

FGR006 : over the version 3.00
FGR006EX : over the version 3.00

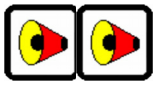
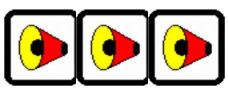
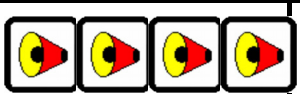




11.1. LED Indicators Status

LED	STATUS	FUNCTION
	Booting	The system is booting when power is supplied
	Register Master Card	The unit is initialized and master card is unregistered
	Registration Mode	Add / Delete user
	Reader Mode	Verify user card
	Initialization	The unit is initialized
	Initialization Completed	System initialization is completed

11.2. Buzzer Sound Status

BEEP SOUND	TIMES	STATUS
	1 time(1second)	Access granted.
	2 times	Error(Fingerprint or operation error)
	3 times	Register user card.
	4 times	Delete user card.

12. FCC Registration Information

FCC REQUIREMENTS PART 15

Caution: Any changes or modifications in construction of this device which are not expressly approved by the responsible for compliance could void the user's authority to operate the equipment.

NOTE: This device complies with **Part 15 of the FCC Rules**.

Operation is subject to the following two conditions;

1. This device may not cause harmful interface, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a **Class A Digital Device**, pursuant to **Part 15 of the FCC Rules**. These limits are designed to this equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the radio or television off and on, the user is encouraged to try to correct interference by one or more of the following measures.

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on another circuit.
4. Consult the dealer or an experienced radio/TV technician for help.